The University of Mindanao

College of Engineering Education
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CE 601– MSTE [Engr. Calaque, Dario Jr. A]

5th QUIZ
INSTRUCTIONS:
a. CHEATING IS PROHIBITED! Mind your own paper. Any act of cheating (using of cellular phones, books, and lecture materials during examination, copying answers from your seatmate, etc.) will result to failure of examination.
b. No borrowing of calculator.

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01. An engineer is thinking of starting a part-time consulting business next September 5, on his 40th birthday. He expects the business will require an initial cash outlay of $5000, to come from his savings, and will cost $500 per year to operate; the business ought to generate $2,000 per year in cash receipts. During the 20 years that he expects to operate the business, he plans to deposit the annual net proceeds in a bank each year , at an interest rate of 8% per year, compounded annually. When he retires, on his 60th birthday, the engineer expects to invest whatever proceeds plus interest he then has from the business in a long term saving plan that pays 10% per year, compounded annually. What is the maximum amount he could withdraw from the savings plan each year during his retirement and still have the funds last 15 years?

a) $5960.78

b) $6204.25

c) $5456.54

d) $7254.85

02. A, B and C are three triangulation stations whose positions were determined by the angle measured at station B to A and C, respectively. The distance BC was measured to be 1200m long and CD is 965m long. The azimuth of C from B is 140^0 and that of A from B is $286^0 30'$. A sounding at F (south of the three stations) was taken from a boat and the angle BFA and BFC were measured simultaneously by two sextants from the boat to the three stations ABC as $22^0 30'$ and $28^0 15'$, respectively. How far is F from B?

a) 1790m

b) 1880m

c) 2466m

d) 2380m

03. The wavelength of a deep water wave during typhoon Vinta at the port of Iligan is 310m. The of still water is located 0.95m below the centerline of the rotation of the wave. If the steepness of the wave is 0.16m, determine the vertical distance of the wave through from the bottom of the ocean if its depth of still water is 50m above the bottom of the ocean.

a) 29.65m

b) 30.10m

c) 26.15m

d) 22.30m

04. Pepys wrote Newton to ask which of three events is more likely: that a person get (a) at least 1 six when 6 dice are rolled, (b) at least 2 sixes when 12 dice are rolled, or (c) at least 3 sixes when 18dice are rolled. What is the answer?

a) Rolling 6 dice will do better than 12 or 18

b) Rolling 12 dice will do better than 6 or 18

c) Rolling 18dice will do better than 6 or 12

d) None of these

05. Given the geometric relationships, which of these statements are true?

I. At the PC (Point of Curvature) and PT(Point of Tangency), the radius and tangent are perpendicular

II. The angle between the tangent and the long chords originating at the PC (Point of Curvature) or PT (Point of Tangency) , is equal to one half of "I" (angle of P.I)

III. The curvature at the center of the circle that subtends the arc between the PC (Point of Curvature) and the PT (Point of Tangency) is called the central angle. Its value is the same as the "I" angle.

a) I and II only

b) All of the above

c) II and III only

d) I only

06. A rectangular barge 12m x 20m x 8m high weighs 1000tonnes. The maximum depth of water is 6.4m and the design low tide (DLT) is -0.30m. What is the maximum load that the barge can carry based on the standards of the Philippine Ports Authority.

a) 450tonnes

b) 500tonnes

c) 650tonnes

d) 380tonnes

07. Determine the area of the given closed traverse

LINE	LENGTH	BEARING
AB	42.0	$N64^0 32'E$
BC	12.0	$S38^0 45'E$
CD	18.5	$S34^0 56'W$
DE	28.4	$S72^0 12'W$
EA	17.0	$N27^0 14'W$

a) 820.6sq.m

b) 786.4sq.m

c) 648.8sq.m

d) 867.9sq.m

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08. A total of 300people composed of students and teachers in a certain school are asked in a pool. The answer of the poll are either they are to agree, disagree or just be neutral to an issue being asked. For the students, there are 132 who agreed, 78 who disagreed and 54 are neutral. There are 5 who agree, 14 who disagree and 17 are neutral from the teachers. If a teacher and a student are randomly selected, what is the probability that they either agree or neutral?

a) 0.486

b) 0.552

c) 0.694

d) 0.431

09. Given the following data for lot ABCD:

Line	Length, m	Bearing
AB	196.35	$N25^0 32'E$
BC	?	?
CD	136.98	$S21^0 9'E$
DA	355.32	$S77^0 20'W$

Find the cost of the lot if it cost P3.1M per hectare.

a) P13.254M

b) P13.524M

c) P12.256M

d) P12.927M

10. What is the meaning of MLLW?

a) Lower Mean Low Water

b) Mean Lower Low Water

c) Mean Low Level Water

d) Mean Lower Level Water

11. Daily sales records for an engineering consulting firm shows that it will attract 0, 1 or 2 consulting jobs per day with probabilities as given below.

Consulting Jobs	0	1	2
Probability	0.1	0.75	0.15

Find the probability that it will attract 2 consulting jobs in a two-day period, assuming the number of consulting jobs are independent from day to day.

a) 0.6325

b) 0.5925

c) 0.5275

d) 0.7125

12. Waves under the influence of the winds that generated them are called.

a) Wakes

b) Sea

c) Swells

d) Seiching

13. The observed interior angles of a quadrilateral and their corresponding number of observations are as follows:

Corner	Angle	No. of Observations
1	67^0	5
2	132^0	6
3	96^0	3
4	68^0	4

Determine the corrected angle at corner 3.

a) $96^0 32'$

b) $94^0 57'$

c) $97^0 31'$

d) $95^0 27'$

14. Given: First Cost, FC = P800,000

Salvage Value, SV = P80,000,

Useful life = 5 years.

Compute the depreciation on the 3rd year using the modified accelerated cost recovery system (MACRS) method.

a) 115,200

b) 135,000

c) 110,000

d) 153,600

15. Eleven books, consisting of 5 engineering books, 4 mathematics books, and 2 chemistry books, are placed on a shelf at random. What is the probability that the books of each kind are all together?

a) 1/1555

b) 1/1505

c) 1/1550

d) 1/1155

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16. Given the latitudes and departures of a certain traverse.

		Latitudes		Departures	
Line	Distance	N. Lat	S. Lat	E. Dep.	W. Dep
AB	677.97	667.6701			117.7283
BC	616.05		166.1858	593.2115	
CD	690.88	131.0369		678.3395	
DE	783.82		759.9266		192.0558
EA	970.26	127.4838			961.8484

Determine the adjusted direction and distance of line CD.

a) 690.868m, $N79^0 3' 55'' E$

b) 690.521m, $N78^0 54' 12'' E$

c) 690.254m, $N79^0 24' 15'' E$

d) 690.892m, $N79^0 4' 5'' E$

17. In many parts of the world, the high waters reach their greatest height and the low waters at the least height, soon after the time of full and new moon, this tides are called:

a) Spring tides

b) Neap tides

c) Flood tides

d) Ebb tides

18. A water park is considering two location for development – one in Laguna and one in Cavite. Based on the following weightings for the factors below, which area represents the best location?

Factor Description	Weight	Laguna	Cavite
Proximity to market	0.30	80	50
Infrastructure	0.20	50	40
Weather	0.25	30	70
Labor Availability	0.25	60	80

a) None of these

b) Cavite

c) Laguna

d) All of these

19. A reversed curve of equal radii connects two parallel tangents 12m apart. The length of the chord from PC to PT is 140m. Determine the radius of the curve.

a) 408.3m

b) 425.8m

c) 387.6m

d) 489.3m

20. Given $nC_{10} = 22nC_{12}$, determine the value of n.

a) 12

b) 15

c) 17

d) 13

21. The top of the tower at B 2000m away from A where the transit is set, has a vertical angle of $3^0 30'$. The height of the mast is 12m an the height of the instrument at A is 1.10m. If the elevation of the base of the instrument is 133.3m, determine the elevation of the base of the tower.

a) 225.625m

b) 224.995m

c) 228.369m

d) 232.587m

22. A 100m tape weighing 5.08kgs was used to measure a line. It was supported at the endpoints, midpoint, and a quarter points and the tension applied is 60N. If the total measured distance is 2432.65m, what is the correct distance of the line?

a) 2437.02m

b) 2428.28m

c) 2430.36m

d) 2431.36m

23. The common tangent AB of a compound curve is 85.36m. The angles the common tangent makes with the tangents through PC and PT of the compound curve are $22^0 20'$ and $15^0 40'$, respectively. If the degree of the first curve is $3^0 30'$, what is the degree of the second curve?

a) 5.24

b) 6.42

c) 8.11

d) 7.61

24. An equipment costing P2.1M has a salvage value of P840,000 at the end of its economic life. Find its economic life if using the SOYD method of depreciation, its book value at the end of two years is P1,440,000.

a) 8yrs.

b) 5yrs.

c) 4yrs.

d) 6yrs.

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25. The following alternatives are to be compared based on 8% interest rate

Machine	A	B
First Cost	5,000	10,000
Annual Maintenance	500	200
Salvage value	600	1,000
Useful Life (years)	5	12

What is the equivalent uniform annual cost (EAUC) of machine A?

a) 1474

b) 1385

c) 1650

d) 1720

----------Nothing Follows----------